

ITT Technical Institute

NT2740

Advanced Networking Devices

Onsite and Online Course

SYLLABUS

Credit hours: 3


Contact/Instructional hours: 40 (20 Theory Hours, 20 Lab Hours)

Prerequisite(s) and/or Corequisite(s):

NT2640 IP Networking or equivalent

Course Description:

This course is an intensive study of routers, switches, and other computer and telecommunication network devices. Instruction will include network and routing protocols, local and wide area networks, and VLANs as well as device configuration, management, and troubleshooting. This course examines the concepts found in the Cisco Certified Entry Networking Technician (CCENT) certification exam.



COURSE SUMMARY

COURSE DESCRIPTION

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MAJOR INSTRUCTIONAL AREAS

1. Network Devices
2. LAN Switching
3. IP Addressing (IPv4/IPv6)
4. IP Routing
5. IP Services
6. Network Device Security
7. Troubleshooting

COURSE LEARNING OBJECTIVES

By the end of this course, you should be able to:

1. Describe the purpose and functions of various network devices such as Routers, Switches, Bridges, and Hubs.
2. Manage network devices.
3. Modify IOS configurations.
4. Manage IP addressing and subnetting.
5. Configure IP services.
6. Configure device security features.
7. Troubleshoot IP networks and devices.

COURSE OUTLINE

MODULE 1: MANAGING NETWORK DEVICES

COURSE LEARNING OBJECTIVES COVERED

- Describe the purpose and functions of various network devices such as Routers, Switches, Bridges, and Hubs.
- Manage network devices.

TOPICS COVERED

- ICND1 Certification Exam
- Review of Networking Fundamentals
- LAN Switching Concepts
- Identification of Appropriate Network Devices

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Odom, W., Chapters 6, 7, and 15.	No	4.5 hrs
Reading: ITT Tech Virtual Library> Basic Search> <i>CCNA routing and switching review guide: Exams 100-101, 200-101, and 200-120, Chapter 1.</i>	No	2.5 hrs
Lesson: Study the lesson for this module.	No	1.5 hrs
Discussion: Participate in the discussion titled “Selection of Network Devices.”	Yes	N/A
Lab: Complete the lab titled “Router Configuration.”	Yes	N/A

Total Out-Of-Class Activities: 8.5 Hours

MODULE 2: CONFIGURING CISCO IOS

COURSE LEARNING OBJECTIVES COVERED

- Manage network devices.
- Modify IOS configurations.

TOPICS COVERED

- Cisco IOS Configuration Files
- Operating Cisco Routers
- Boot Process for Cisco Routers and Switches
- Setup Mode
- Basic Router Configuration Using CLI

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Odom, W., Chapters 8 and 18.	No	4 hrs
Reading: ITT Tech Virtual Library> Basic Search> <i>CCNA routing and switching review guide: Exams 100-101, 200-101, and 200-120, Chapters 2 and 4.</i>	No	6 hrs
Lesson: Study the lesson for this module.	No	2 hrs
Discussion: Participate in the discussion titled “Encrypting Passwords.”	Yes	N/A
Lab 1: Complete the lab titled “Switch Configuration.”	Yes	N/A
Lab 2: Complete the lab titled “Switch Port Security Features Configuration.”	Yes	N/A
Exam: Prepare for Exam 1.	No	5 hrs

Total Out-Of-Class Activities: 17 Hours

MODULE 3: IP ADDRESSING

COURSE LEARNING OBJECTIVES COVERED

- Modify IOS configurations.
- Manage IP addressing and subnetting.

TOPICS COVERED

- Private and Public IP Addresses
- IPv4 and IPv6 Addressing
- Using VLSM and Summarization

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Odom, W., Chapters 11, 19, 26, 27, and 28.	No	10 hrs
Reading: ITT Tech Virtual Library> Basic Search> <i>CCNA routing and switching review guide: Exams 100-101, 200-101, and 200-120, Chapter 3.</i>	No	3 hrs
Lesson: Study the lesson for this module.	No	2 hrs
Discussion: Participate in the discussion titled “Public IP Addressing Versus Private IP Addressing.”	Yes	N/A
Lab 1: Complete the lab titled “IPv4 Addressing.”	Yes	N/A
Lab 2: Complete the lab titled “Subnets and Public Addresses in Internetwork.”	Yes	N/A
Exam: Take Exam 1.	Yes	N/A

Total Out-Of-Class Activities: 15 Hours

MODULE 4: CONFIGURING IP SERVICES

COURSE LEARNING OBJECTIVES COVERED

- Configure IP services.
- Configure device security features.

TOPICS COVERED

- Configure and Verify DHCP
- Applications of ACLs
- Basic Operation of NAT
- Configure and Verify NTP

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Odom, W., Chapters 18, 22 (pp. 528-531), and 24.	No	8 hrs
Reading: ITT Tech Virtual Library> Basic Search> <i>CCNA routing and switching review guide: Exams 100-101, 200-101, and 200-120, Chapter 5.</i>	No	3 hrs
Lesson: Study the lesson for this module.	No	2 hrs
Discussion: Participate in the discussion titled “ACL Interfacing.”	Yes	N/A
Lab 1: Complete the lab titled “NTP Configuration.”	Yes	N/A
Lab 2: Complete the lab titled “DHCP Configuration.”	Yes	N/A
Exam: Prepare for Exam 2.	No	5 hrs

Total Out-Of-Class Activities: 18 Hours

MODULE 5: NETWORK DEVICE SECURITY

COURSE LEARNING OBJECTIVES COVERED

- Describe the purpose and functions of various network devices such as Routers, Switches, Bridges, and Hubs.
- Manage network devices.
- Modify IOS configurations.
- Manage IP addressing and subnetting.
- Configure IP services.
- Configure device security features.

TOPICS COVERED

- Configure Network Device Security Features
- Configure and Verify ACLs
- Limit Telnet and SSH
- Predict and Trace Data Flow Between Two Hosts

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Odom, W., Chapters 22 (pp. 536-544) and 23.	No	4 hrs
Reading: ITT Tech Virtual Library> Basic Search> <i>CCNA routing and switching review guide: Exams 100-101, 200-101, and 200-120, Chapter 6.</i>	No	3 hrs
Lesson: Study the lesson for this module.	No	2 hrs
Lab 1: Complete the lab titled “Configuring ACLs.”	Yes	N/A
Lab 2: Complete the lab titled “Security Features Configuration.”	Yes	N/A
Exam: Take Exam 2.	Yes	N/A
Final Exam: Prepare for the final exam.	No	5 hrs

Total Out-Of-Class Activities: 14 Hours

MODULE 6: TROUBLESHOOT IP NETWORK AND DEVICES

COURSE LEARNING OBJECTIVES COVERED

- Describe the purpose and functions of various network devices such as Routers, Switches, Bridges, and Hubs.
- Manage network devices.
- Modify IOS configurations.
- Manage IP addressing and subnetting.
- Configure IP services.
- Configure device security features.
- Troubleshoot IP networks and devices.

TOPICS COVERED

- Common Network Problems
- Troubleshoot VLAN Problems
- Netflow Statistics
- Review and Exam Preparation

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Odom, W., Chapters 10 and 18.	No	6 hrs
Lesson: Study the lesson for this module.	No	2 hrs
Discussion: Participate in the discussion titled “Self-Reflection.”	Yes	N/A
Lab: Complete the lab titled “CDP Configuration.”	Yes	N/A
Final Exam: Take the final exam.	Yes	N/A

Total Out-Of-Class Activities: 8 Hours

EVALUATION AND GRADING

EVALUATION CRITERIA

The graded assignments will be evaluated using the following weighted categories:

CATEGORY	WEIGHT
Discussion	10%
Lab	30%
Exam	35%
Final Exam	25%
TOTAL	100%

GRADE CONVERSION

The final grades will be calculated from the percentages earned in the course, as follows:

GRADE	PERCENTAGE
A (4.0)	90–100%
B+ (3.5)	85–89%
B (3.0)	80–84%
C+ (2.5)	75–79%
C (2.0)	70–74%
D+ (1.5)	65–69%
D (1.0)	60–64%
F (0.0)	<60%

LEARNING MATERIALS AND REFERENCES

REQUIRED RESOURCES

COMPLETE TEXTBOOK PACKAGE

- Odom, W. (2013). *Cisco CCENT/CCNA ICND1 100-101 official Cert guide, academic edition*. Upper Saddle River, NJ: Cisco Press.
- Odom, W. (2014). *Cisco CCENT ICND1 100-101 network simulator*. Upper Saddle River, NJ: Cisco Press.

RECOMMENDED RESOURCES

- Books and Professional Journals
 - Odom, W. (2013). *Introduction to networking*. Boston, MA: Pearson IT Certification.
 - Oliviero, A. and Woodward, B. (2009). *Cabling: The complete guide to copper and fiber-optic networking (4th ed.)*. Hoboken, NJ: John Wiley and Sons, Inc. [Custom Update Edition].
 - Odom, W. (2011). *IP networking*. Boston, MA: Pearson Certification.
 - Richardson, T. (2013). *Introduction to networking lab manual*. Boston, MA: Pearson IT Certification.
 - Walker, M., & Walker, A. (2008). *CCENT Cisco certified entry networking technician study guide (exam 640-822)*. New York: McGraw-Hill.
- Professional Associations
 - American Registry for Internet Numbers
<https://www.arin.net>
 - American National Standards Institute
<http://www.ansi.org/>
 - Defense Advanced Research Projects Agency
<http://www.darpa.mil/>
 - Institute of Electrical and Electronic Engineers
<http://www.ieee.org>
 - International Organization for Standardization
<http://www.iso.org>
 - Internet Assigned Numbers Authority

- <http://www.iana.org/>
- ITT Tech Virtual Library (accessed via Student Portal | <https://studentportal.itt-tech.edu>)
 - Basic Search>
 - Angelescu, S. (2010). *CCNA certification all-in-one for dummies*. Hoboken, NJ: For Dummies.
 - Blank, Andrew G. (2002). *TCP/IP jumpstart: Internet protocol basics*. San Francisco: Sybex.
 - Clarke, G. E. (2011). *CCENT certification all-in-one for dummies*. Hoboken, NJ: For Dummies.
 - Gallo, M. A., & Hancock, B. (2002). *Networking explained (2nd ed.)*. Woburn, MA: Butterworth-Heinemann.
 - Groth, D. (2002). *Network+ study guide (3rd ed.)*. San Francisco: Sybex.
 - Lammler, T. (2014). *CCNA routing and switching review guide: Exams 100-101, 200-101, and 200-120*.
 - Other References
 - <http://ciscosystems.meetup.com/>

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INSTRUCTIONAL METHODS AND TEACHING STRATEGIES

The curriculum employs a variety of instructional methods that support the course objectives while fostering higher cognitive skills. These methods are designed to encourage and engage you in the learning process in order to maximize learning opportunities. The instructional methods include but are not limited to lectures, collaborative learning options, use of technology, and hands-on activities.

To implement the above-mentioned instructional methods, this course uses several teaching strategies, such as real-life scenarios, review quizzes, and interactive practice exercises. Your progress will be regularly assessed through a variety of assessment tools including discussions, labs, exams, and a final exam.

OUT-OF-CLASS WORK

For purposes of defining an academic credit hour for Title IV funding purposes, ITT Technical Institute considers a quarter credit hour to be the equivalent of: (a) at least 10 clock hours of classroom activities and at least 20 clock hours of outside preparation; (b) at least 20 clock hours of laboratory activities; or (c) at least 30 clock hours of externship, practicum or clinical activities. ITT Technical Institute utilizes a “time-based option” for establishing out-of-class activities which would equate to two hours of out-of-class activities for every one hour of classroom time. The procedure for determining credit hours for Title IV funding purposes is to divide the total number of classroom, laboratory, externship, practicum and clinical hours by the conversion ratios specified above. A clock hour is 50 minutes.

A credit hour is an artificial measurement of the amount of learning that can occur in a program course based on a specified amount of time spent on class activities and student preparation during the program course. In conformity with commonly accepted practice in higher education, ITT Technical Institute has institutionally established and determined that credit hours awarded for coursework in this program course (including out-of-class assignments and learning activities described in the “Course Outline” section of this syllabus) are in accordance with the time-based option for awarding academic credit described in the immediately preceding paragraph.

ACADEMIC INTEGRITY

All students must comply with the policies that regulate all forms of academic dishonesty or academic misconduct. For more information on the academic honesty policies, refer to the Student Handbook and the School Catalog.

INSTRUCTOR DETAILS

Instructor Name	
Office Hours	
Contact Details	

(End of Syllabus)